Date: Sun, 24 Oct 93 04:30:14 PDT
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V93 #88
To: Ham-Ant

Ham-Ant Digest Sun, 24 Oct 93 Volume 93 : Issue 88

Today's Topics:

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

Date: 22 Oct 1993 16:26:36 -0500
From: swrinde!cs.utexas.edu!not-for-mail@network.ucsd.edu
Subject: 5/8 wave questions
To: ham-ant@ucsd.edu

Hi,
I've built some simple 1/4 wave ground plane antennas for 2M that work fairly well, but now I want to do something that will give me some more gain. 5/8 wave antennas look interesting - omnidirectional, with more gain. I've got some questions about homebrewing a few.

Is a 5/8 wave vertical just a gp with a longer radiator, or does it need a base loading coil?

Is the feed point impedance of a 5/8 wave 50 ohms?

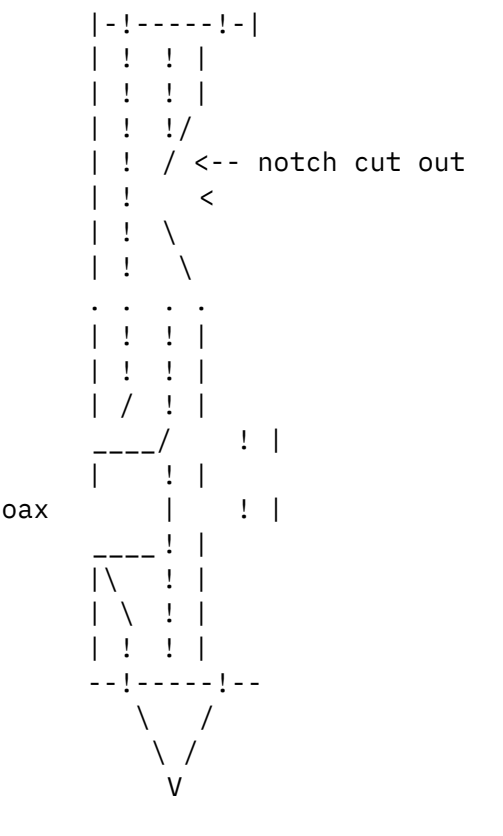
I've seen some commercial units that are 2 and 3 element 5/8 wave collinears.

How do these stack? Do you just put them in series with some form of network
to separate them?

Thanks,
Joe (wishing he would have bought the ARRL antenna book) Landis - N3PQY
Internet: landisj@drager.com

Date: Fri, 22 Oct 1993 15:44:44 -0700
From: orca.es.com!cnn.sim.es.com!msanders.sim.es.com!user@uunet.uu.net
Subject: Anyone seen this?
To: ham-ant@ucsd.edu

In article <2a783n$f8u@news.u.washington.edu>, jerryh@cac.washington.edu
(Jerry Hargrove) wrote:

>
> I recently saw designs for this simple antenna but can't remember where.
>
> Kind of looked like this:
>
>


>
> solder ends together
--

Jerry:

I have one of these: it is called a JPole. I have the dimensions at home, but not here at work. As I remember, it is roughly 54" long, the coax connection spots are somewhere between 2-4 inches up from the bottom with the center lead soldered to the right hand side in this diagram, and the notch cut out somewhere around 15 3/4 inches up. Someone else will give the correct dimensions. Mine is mounted inside a 3-section 3/4" diameter PVC pipe, with an elastic cord holding it up inside. I can pull the sections apart, put it in my suitcase, and travel on. It works great with my 2M rigs at home or out camping.

Milt

==========

Opinions, thoughts, &cetera are my own (when I can remember them).

"He flies the sky
Like an Eagle in the eye
of a hurricane that's abandoned."

KB7MSF
Amateur Radio
"Sandman"
Utah

America

Date: 23 Oct 1993 14:53:17 GMT
From: elroy.jpl.nasa.gov!swrinde!cs.utexas.edu!asuvax!chnews!news@decwrl.dec.com
Subject: Cellular Antenna
To: ham-ant@ucsd.edu

In article <CFB3JD.y1r@hawnews.watson.ibm.com> djweiss@vnet.ibm.com writes:

>I am trying to figure out what type of cellular radio
>antenna to put on my new Jeep Grand Cherokee...

>Should I go with a high feed glass mount (claims of 3:1 to
>5:1 gain), or the unity gain roof mount antenna?

>I think I would prefer the roof mount...as it is low, and
>doesn't break off in car washes.

How about *both* high-gain and roof-top mounting? I have had

good results using Larsen LMO-type mounts on my pickup for
VHF and UHF antennas. I have to remove the antennas every
night to get the truck in my garage. The LMO mounts screw
and unscrew by hand, yet are sturdy and waterproof. I am
pretty sure Larsen makes an LMO model for 900 MHz cellular.
And, it has 3 - 6 db gain over a quarter-wave antenna.

There is also the NMO-type mount. It is bigger and somewhat
stronger than the LMO, but requires a 3/4-inch hole (I think)
rather than the 3/8-inch one for an LMO. It might be a good
choice - take a look at it. You can get the same variety of
"whips" for either.

I would stay away from glass-mount antennas, even though
everyone uses them for cellular. I am assuming you want
something with much better overall performance than the
average cellular installation.

+-------------------------+--+
Jim Bromley W5GYJ	
Intel Corp. m/s C11-91	This message transmitted with
5000 W. Chandler Blvd.	100% recycled electrons.
Chandler,AZ 85226	
tel: 602-554-5183	Internet: jbromley@sedona.intel.com
+-------------------------+--+

Date: Fri, 22 Oct 1993 16:09:13 GMT
From: newsgate.watson.ibm.com!hawnews.watson.ibm.com!news@uunet.uu.net
Subject: Cellular Antenna
To: ham-ant@ucsd.edu

I am trying to figure out what type of cellular radio antenna to put on my new
Jeep Grand Cherokee. Obvious choices are window mount with an antenna that
puts the coil above the roofline.....or...one of the unity gain short antennas
on the roof.

I think I would prefer the roof mount...as it is low, and doesn't break off in
car washes. However, I don't know how well it will work given that it will sit
between the roof rack supports which run front to back on either side of the Jeep.
A glass mount would go on the rear side glass which fortunately is just lightly
tinted...
(I know that heavy tinting is a problem).

I can't find any newsgroup that deals with cellular telephone antennas...but given
that
it is just an 800mhz signal....I figured that this is not a bad place to ask the

question.

Should I go with a high feed glass mount (claims of 3:1 to 5:1 gain), or the unity gain
roof mount antenna?

****

Date: Fri, 22 Oct 1993 19:57:25 GMT
From: dog.ee.lbl.gov!agate!spool.mu.edu!umn.edu!msc.edu!cdsmail!
mac_arhbld3n2_148.subnet66.cdc.com!user@network.ucsd.edu
Subject: Dual Mobile Mirror-Mount Antennas?
To: ham-ant@ucsd.edu

What's the deal with these vehicles (usually trucks) that have a
mirror-mounted vertical antenna mounted on each side of the vehicle? I
believe these are usually CB installations. Is there any benefit to having
two antennas on the vehicle as opposed to having a single one or does this
just look "cool"?

--
Vern Suter   phone: (612) 482-4810
Control Data System, Inc.   email: Vern.L.Suter@cdc.com

Date: 23 Oct 93 15:46:56 GMT
From: ogicse!emory!rsiatl!ke4zv!gary@network.ucsd.edu
Subject: Dual Mobile Mirror-Mount Antennas?
To: ham-ant@ucsd.edu

In article <VERN.L.SUTER-221093135725@mac_arhbld3n2_148.subnet66.cdc.com>
VERN.L.SUTER@cdc.com (Vern Suter) writes:
>What's the deal with these vehicles (usually trucks) that have a
>mirror-mounted vertical antenna mounted on each side of the vehicle? I
>believe these are usually CB installations. Is there any benefit to having
>two antennas on the vehicle as opposed to having a single one or does this
>just look "cool"?

This is called a "co-phased" antenna. It's two vertical radiators
connected by a phasing harness. At a spacing of about 8 feet, and
fed from a Tee by two 1/4 wave 75 ohm cables, the antenna gives
a figure 8 pattern that's aligned broadside to the antennas, IE
up and down the road. That's just what the trucker wants. The gain
is only 3 db, but the null off the sides can be quite sharp.

Gary

--
Gary Coffman KE4ZV |"If 10% is good enough | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | for Jesus, it's good | uunet!rsiatl!ke4zv!gary
534 Shannon Way | enough for Uncle Sam."| emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -Ray Stevens |

Date: Fri, 22 Oct 1993 20:40:00 GMT
From: swrinde!cs.utexas.edu!math.ohio-state.edu!sol.ctr.columbia.edu!
hamblin.math.byu.edu!wicat!keithm@network.ucsd.edu
Subject: j-pole question
To: ham-ant@ucsd.edu

Gary.Donnelly@f239.n109.z1.fidonet.org (Gary Donnelly) writes:

>I am looking for a basic question relative to a j-pole. The
>plans that I have call for using a 300 ohm twin lead and
>connect it to RG58. Isn't this going to be an impedance
>missmatch?

No. That's what the 'J' part of the J-pole antenna does
for a living. It matches the 50 ohm feedline to the high
impedance end-fed half-wave section of the antenna.

BTW, a "twin-lead J-pole" made from 300 ohm twinlead does
not have an impedance of 300 ohms.

--
Keith McQueen, Wicat Systems Inc. , (801)223-3284 | My opinions are |
Packet: n7hmf @ nv7v.UT.USA.NA | all mine... |
Internet: keithm@wicat.com | ...so there! |

Date: Fri, 22 Oct 1993 17:03:32 GMT
From: pa.dec.com!oct17.dfe.dec.com!ryn.mro4.dec.com!est.enet.dec.com!
randolph@decwrl.dec.com
Subject: SWR measurements are too good!
To: ham-ant@ucsd.edu

In article <1993Oct20.181229.719@TorreyPinesCA.ncr.com>,
kevin@TorreyPinesCA.ncr.com (Kevin Sanders) writes...
>My question is, where is my power going? Where is the SWR dip I expected to

>see? The antenna appears to work OK, so should I care? I can't believe the
>antenna is so wide-band that I can't find an SWR over 1.1:1 anywhere in the
>220 band, no matter where the shorting bar is or whether I use one.
>
>Oh, if it makes any difference (I don't think it should), I'm using 100 ft
>of RG-58 coax between the meter and the transceiver. Lossy as heck I know,
>(35 watts out becomes 5 watts at the antenna!) but this is just for testing.

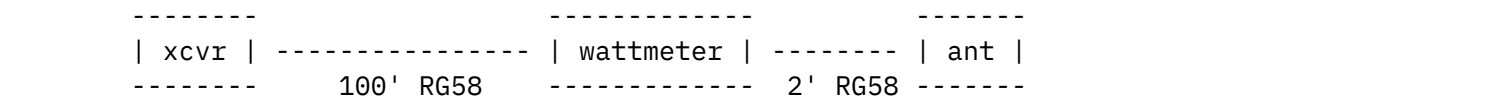
I think you just answered your question. Any way you can shorten this 100 ft.? Barring that, disconnect the antenna from the line and then see what your SWR reads. If it's not very high, cable loss is your problem. It should go infinite into an open circuit, but 100 ft. of RG58 will probably show you a measureable SWR. You can prabably see why this is so: 35W in, 5W out. Assume 100% of that gets reflected by the antenna (open circuit): 5W in, 0.7W arrives back at your SWR meter, giving you an SWR of 1:1.04 for an open circuit!

BTW, I'm currently pruning a 2m, 5-element Yagi-Uda that I made out of an old TV antenna. Another evening or two and I should have it resonant. I'm using a 3W HT, a foot of RG58, an SWR meter, 5 more feet of RG58, and the antenna. It will go at the end of 50 ft. of 9913 on the chimney.
-Tom R.   N1OOQ   randolph@est.enet.dec.com

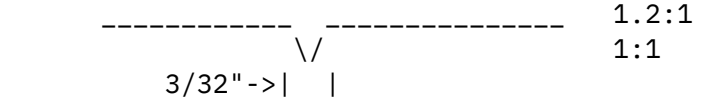
Date: Fri, 22 Oct 93 16:59:08 GMT
From: ncrgw2.ncr.com!ncrhub2!torynews!kevin@uunet.uu.net
Subject: SWR measurements are too good!
To: ham-ant@ucsd.edu

OK folks the "mystery" is solved.

Here's a diagram of my test configuration (many folks misunderstood):



It turns out that there *is* a dip in measured SWR, but it is so narrow I did not see it at first. I was expecting more of a smooth, shallow curve but instead see something like this (X is length of gamma section, Y is measured SWR):



The dip is 1:1 (or very close to that; I will need to use lower-loss coax

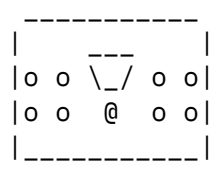
from the transceiver to make the final tuning adjustment. The portion which is outside the dip is essentially flat, measuring 1.2:1 SWR. Removing the antenna from the 2-foot jumper and leaving the jumper only attached to the wattmeter, I measure 1.5:1 SWR. So it appears that the jumper along with the length of the PL259 socket and the wire connecting the PL259 socket to the antenna element is of a length which provides a very good match to a 50 ohm impedance. When the shorting bar is not in the "sweet spot" the matching section is an RF OPEN, hence most or all power is reflected back through the jumper.

The lesson I learned here is, one cannot make any assumptions about where the power is going when measuring SWR. All possible paths must be considered; any connection point can reflect power as well as transfer it. The length of jumper cables may be critical in the measurement, so I should make a few varying lengths of jumpers to verify measurements. If the SWR curve changes as the length of a piece of transmission line changes, then I've just identified a point of mismatched impedance at a connector.

Thanks for all the input!

--

  Kevin Sanders, KN6FQ
  kevin.sanders@torreypinesca.ncr.com
  kevin%beacons@cyber.net



Try Boatanchors
For A Real Lift

Date: 23 Oct 93 15:43:49 GMT
From: ogicse!emory!rsiatl!ke4zv!gary@network.ucsd.edu
Subject: SWR measurements are too good!
To: ham-ant@ucsd.edu

In article <1993Oct22.165908.10180@TorreyPinesCA.ncr.com>
kevin@TorreyPinesCA.ncr.com (Kevin Sanders) writes:
>OK folks the "mystery" is solved.
>
>Here's a diagram of my test configuration (many folks misunderstood):
>
>   --------   -------------   -------
> | xcvr | ---------------- | wattmeter | -------- | ant |
>   --------   100' RG58   ------------- 2' RG58 -------
>
>It turns out that there *is* a dip in measured SWR, but it is so narrow I
>did not see it at first. I was expecting more of a smooth, shallow curve
>but instead see something like this (X is length of gamma section, Y is
>measured SWR):

>
>   ------------ ----------------   1.2:1
>   \/   1:1
>   3/32"->| |
>
>
>The dip is 1:1 (or very close to that; I will need to use lower-loss coax
>from the transceiver to make the final tuning adjustment. The portion which
>is outside the dip is essentially flat, measuring 1.2:1 SWR. Removing the
>antenna from the 2-foot jumper and leaving the jumper only attached to the
>wattmeter, I measure 1.5:1 SWR. So it appears that the jumper along with the
>length of the PL259 socket and the wire connecting the PL259 socket to the
>antenna element is of a length which provides a very good match to a 50 ohm
>impedance. When the shorting bar is not in the "sweet spot" the matching
>section is an RF OPEN, hence most or all power is reflected back through
>the jumper.
>
>The lesson I learned here is, one cannot make any assumptions about where
>the power is going when measuring SWR. All possible paths must be considered;
>any connection point can reflect power as well as transfer it. The length of
>jumper cables may be critical in the measurement, so I should make a few
>varying lengths of jumpers to verify measurements. If the SWR curve changes
>as the length of a piece of transmission line changes, then I've just
>identified a point of mismatched impedance at a connector.

I think what you're going to find is that your two foot jumper is
defective. It should not read 1.5:1 with the end open circuited.
It should read 20:1 or higher. Your Yagi should have a 2:1 bandwidth
of about 5 MHz, and should show a pronounced and fairly broad dip
about 2 MHz wide.

Gary

--
Gary Coffman KE4ZV |"If 10% is good enough | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | for Jesus, it's good | uunet!rsiatl!ke4zv!gary
534 Shannon Way | enough for Uncle Sam."| emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -Ray Stevens |

Date: Fri, 22 Oct 1993 23:11:35 GMT
From: fluke!rem@beaver.cs.washington.edu
To: ham-ant@ucsd.edu

References <1993Oct20.181229.719@TorreyPinesCA.ncr.com>,
<CF9910.EEA@cunews.carleton.ca>, <1993Oct21.190751.28809@genroco.com>uw-be
Subject : Re: SWR measurements are too good!

In article <1993Oct21.190751.28809@genroco.com> don@genroco.com (Don Woelz)
writes:
>In article <CF9910.EEA@cunews.carleton.ca> im@hydra.CARLETON.CA (Ian McEachern
VE3PFH) writes:
>
>wave. The SWR of a lossless transmission line is the same anywhere
>on the line.

This is correct.

>On a lossy line, the SWR will vary somewhat, but not

This is not true. Unless the line has a change in characteristic Z, like
a kink in the line where the center conductor and shield have changed
distance or a bad connection where the two lines have been coupled together
to form a long line, the SWR does NOT change along the line.

If you are taking an SWR meter and making a measurement at the input end
and comparing that reading to a reading at the other end, and the SWR
is different, then you are not using a true VSWR meter. You have a device
that is reading forward and reflected power and is calibrated to read
out in SWR. An SWR of 2:1 or what ever is 2:1 all along the line.

SWR on the line is strictly due to the mismatch between the Antenna and the
Lines characteristic Z. The length of the line does not change the lines
characteristic impedence.

Randy
AJ7B

Date: 23 Oct 93 16:38:27 GMT
From: ogicse!emory!rsiatl!ke4zv!gary@network.ucsd.edu
To: ham-ant@ucsd.edu

References <CF9910.EEA@cunews.carleton.ca>, <1993Oct21.190751.28809@genroco.com>,
<CFBn3I.Kuo@tc.fluke.COM>
Reply-To : gary@ke4zv.UUCP (Gary Coffman)
Subject : Re: SWR measurements are too good!

In article <CFBn3I.Kuo@tc.fluke.COM> rem@tc.fluke.COM (Randy Mather) writes:
>In article <1993Oct21.190751.28809@genroco.com> don@genroco.com (Don Woelz)
writes:
>>In article <CF9910.EEA@cunews.carleton.ca> im@hydra.CARLETON.CA (Ian McEachern
VE3PFH) writes:
>>

>>wave. The SWR of a lossless transmission line is the same anywhere
>>on the line.
>
>This is correct.
>
>>On a lossy line, the SWR will vary somewhat, but not
>
>This is not true. Unless the line has a change in characteristic Z, like
>a kink in the line where the center conductor and shield have changed
>distance or a bad connection where the two lines have been coupled together
>to form a long line, the SWR does NOT change along the line.
>
>If you are taking an SWR meter and making a measurement at the input end
>and comparing that reading to a reading at the other end, and the SWR
>is different, then you are not using a true VSWR meter. You have a device
>that is reading forward and reflected power and is calibrated to read
>out in SWR. An SWR of 2:1 or what ever is 2:1 all along the line.
>
>SWR on the line is strictly due to the mismatch between the Antenna and the
>Lines characteristic Z. The length of the line does not change the lines
>characteristic impedence.

VSWR, which can be shown mathematically to be equivalent to ISWR, and
is normally just called SWR, is the ratio of Emax/Emin on the line.
In the case of a *lossless* line, this can be expressed in terms of
impedances thusly:

$$SWR = \frac{(\sqrt{(R+Zo)^2+X^2}+\sqrt{(R-Zo)^2+X^2})}{(\sqrt{(R+Zo)^2+X^2}-\sqrt{(R-Zo)^2+X^2})}$$

Where R is the load resistance, Zo is the cable characteristic
impedance, and X is the reactance. The ratio Emax/Emin is the
same everywhere along the line.

But, when the line has loss, Emax/Emin becomes different along the
line because of the line loss. That's because Emin has to travel
further along the line than Emax to reach the measuring instrument.
It has to go to the end and return to the meter. Thus it incurs a
greater loss. Therefore, if measuring at the input end of the line,
the relation between load end SWR and input SWR becomes:

$$Si = \frac{10^{(Lm/10)} + (Sl-1)/(Sl+1)}{10^{(Lm/10)} - (Sl-1)/(Sl+1)}$$

Where Si is the line input SWR, Lm is the matched line loss, and Sl is
the load end SWR.

Now if we try to cast this in terms of impedance ratios, we find we
must include the loss term along the line such that Emax becomes
a function of length away from the generator to the meter that
decreases with distance, and such that Emin becomes a function of
the *load end Emax* that decreases as it moves back toward the meter.
The independent variable is the loss per foot of the cable *as if it
were matched*. This would show up in the impedance ratio equation
as an R that tends toward Zo as line length increases. I'll leave
the nasty differential equation to a medium with the proper symbols.

This is covered in any good text on transmission line theory.

Gary
--
Gary Coffman KE4ZV |"If 10% is good enough | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | for Jesus, it's good | uunet!rsiatl!ke4zv!gary
534 Shannon Way | enough for Uncle Sam."| emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -Ray Stevens |

End of Ham-Ant Digest V93 #88
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